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10/646,820	08/25/2003	Seiji Aida	241784US0	1812

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EXAMINER

SHOSHO, CALLIE E

ART UNIT PAPER NUMBER

1714

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/646,820

Applicant(s)

AIDA, SEIJI

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,10-14 and 16-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10-14 and 16-22 is/are rejected.
- 7) ☒ Claim(s) 23-25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. All outstanding rejections are overcome by applicants' amendment and 1.132 declaration filed 6/14/06.

The new grounds of rejection set forth below are necessitated by applicants' amendment and thus, the following action is final.

**Claim Rejections - 35 USC § 112**

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 21-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Newly added claims 21 and 22 each recite "the ratio of the parts of the pigment to the parts of the glycol monoalkyl ether is from 80:11 to 70:15". It is the examiner's position that this phrase fails to satisfy the written description requirement under the cited statute since there does not appear to be a written description requirement of the cited phrase in the application as originally filed, *In re Wright*, 866 F.2d 422, 9 USPQ2d 1649 (Fed. Cir. 1989) and MPEP 2163.

As support for newly added claims 21 and 22, applicants point to the examples found in the present specification. However, firstly, while example 4 discloses ratio of pigment to glycol

monoalkyl ether of 70:15, there appears to be no example that discloses ratio of pigment to glycol monoalkyl ether of 80:11. Secondly, while the examples found in the present specification provide support for specific ratios, i.e. 75:12, 80:15, etc., of specific pigment to specific glycol monoalkyl ether, i.e. diethylene glycol mono butyl ether or triethylene glycol mono butyl ether, the examples do not provide support for the broad recitation that the ratio of pigment to glycol monoalkyl ether ranges from 80:11 to 70:15. That is, while there is support for the recitation of specific ratios from the examples, there is no support to broadly recite that the ratio of any pigment to any glycol monoalkyl ether ranges from 80:11 to 70:15 which encompasses ratios, i.e. 77:13, for which there is no support in the specification as originally filed.

**Claim Rejections - 35 USC § 103**

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 3-4, 7-8, 10-11, 14, 16-17, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz (U.S. 6,433,039) in view of Ohta et al. (U.S. 5,954,866) and either Wild et al. (U.S. 5,310,806) or Ueda et al. (U.S. 4,810,612).

Schwarz discloses ink jet ink comprising aqueous pigment dispersion formed by dispersing a maleic anhydride/ $\alpha$ -olefin copolymer in water in the presence of aqueous medium, base, and pigment. It is disclosed that the aqueous medium includes water and organic solvent, i.e. humectant. It is further disclosed that the ink comprises 1-20% pigment, 0.04-4% copolymer, and 80-99.9% aqueous medium comprising ratio of water to solvent of 97:3 to 40:60 from which

it is calculated that the ink comprises approximately 32-97% water and 2.4-54% organic solvent and thus, it is calculated that the ratio of pigment to organic solvent ranges from approximately 0.02 (1/54) to 8.3 (20/2.4) (col.1, lines 6-11, col.5, lines 30-31, col.6, lines 52-58, col.8, lines 14-15, col.9, lines 66-67, col.10, line 66-col.11, line 6, and example I).

The difference between Schwarz and the present claimed invention is the requirement in the claims of (a) specific dispersant, (b) glycol monoalkyl ether, and (c) amounts of pigment, polymer, water, and glycol monoalkyl ether present in the pigment dispersion.

With respect to difference (a), Schwarz discloses the use of dispersant that is maleic anhydride/ $\alpha$ -olefin copolymer while the present claims require dispersant that is monoalkyl maleate graft polymer of maleic anhydride/ $\alpha$ -olefin copolymer.

Wild et al. teach grafting ethylene polymer with monopropyl maleate or mono-2-ethylhexyl maleate in order to produce polymer with excellent adhesivity (col.3, lines 47-57 and col.4, line 6-col.5, line 5) which is especially relevant to inks where it is important that the ink have good adhesion to paper so that the ink does not smear or smudge.

Alternatively, Ueda et al. disclose composition comprising polyolefin grafted with not only maleic anhydride but also with monoalkyl maleate such as monopropyl maleate or monobutyl maleate in order to produce composition with excellent fixability to paper and excellent bending resistance (col.2, lines 47-58 and 63-64, col.3, lines 3-4 and 13-17, col.5, lines 30-31 and 56-57, col.6, lines 22-27 and 59, and col.10, lines 4-5 and 10-11) which is especially relevant to inks where it is important that the ink have good fixability to paper so that the ink

does not smear or smudge and have good bending resistance so that the ink does not crack when the substrate on which it is utilized (i.e. paper) is bent, folded, etc.

With respect to difference (b), Schwarz discloses that the pigment dispersion or ink comprises aqueous medium including organic solvent, i.e. humectant, however, there is no disclosure of glycol monoalkyl ether as presently claimed.

Ohta et al., which is drawn to inks, disclose the use of humectant such as triethylene glycol monobutyl ether in order to prevent clogging of the printer nozzles and improve moisture retention and storage stability (col.8, lines 36-39 and 42-49). Ohta et al. also disclose the equivalence and interchangeability of humectant that is ethylene glycol, as disclosed by Schwarz, and triethylene glycol monobutyl ether, i.e. glycol monoalkyl ether, as presently claimed.

With respect to difference (c), it is noted that it is calculated from present claim 7 or 20, that the presently claimed pigment dispersion comprises approximately 0.9-23% graft polymer, 0.9-17% glycol monoalkyl ether, 46-77% water, and 16-29% pigment while Schwarz discloses the use of 1-20% pigment, 0.04-4% polymer, and 80-99.9% aqueous medium comprising ratio of water to solvent of 97:3 to 40:60 from which it is calculated that the ink comprises approximately 32-97% water and 2.4-54% organic solvent. However, the amounts of Schwarz are based on the amount of ink and not the pigment dispersion.

However, from the examples of Schwarz, it is clear that after producing the pigment dispersion, only water and additive are further added in order to form the ink. Thus, the amounts of pigment, solvent, and polymer disclosed by Schwarz for the ink would increase while the amount of water would decrease based on the pigment dispersion given that the pigment dispersion contains less water than the ink. It would have been within the skill level of one of

ordinary skill in the art to choose amounts of water depending on the desired properties of the ink, i.e. viscosity, surface tension, etc.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art (i) to graft monoalkyl maleate to the maleic anhydride/ $\alpha$ -olefin copolymer of Schwarz in order to produce pigment dispersion or ink with excellent adhesivity or, alternatively, excellent fixability and bending resistance, (ii) to use glycol monoalkyl ether in Schwarz in order to produce ink or pigment dispersion that does not clog the printer nozzles and possesses improved moisture retention and storage stability and (ii) that the amounts of pigment, polymer, water, and solvent in Schwarz would intrinsically overlap those presently claimed, and thus, one of ordinary skill in the art would have arrived at the claimed invention.

6. Claims 5, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz in view of Ohta et al. and either Wild et al. or Ueda et al. as applied to claims 1, 3-4, 7-8, 10-11, 14, 16-17, and 20-22 above, and further in view of Yatake (U.S. 6,890,378).

The difference between Schwarz in view of Ohta et al. and either Wild et al. or Ueda et al. and the present claimed invention is the requirement in the claims of number average molecular weight of the dispersant.

Yatake, which is drawn to inks, discloses the use of dispersant possessing number average molecular weight (Mn) of 100-50,000 and discloses that if Mn is less, printing non-uniformities appear and if Mn is higher, ink viscosity increases and discharge stability deteriorates (col.14, lines 33-40).



In light of the motivation for using dispersant with specific Mn disclosed by Yatake as described above, it therefore would have been obvious to one of ordinary skill in the art to use dispersant with such molecular weight, including that presently claimed, in Schwarz in order to produce ink that possesses good discharge stability and does not exhibit any printing non-uniformities, and thereby arrive at the claimed invention.

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7. Claims 6, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwarz in view of Ohta et al. and either Wild et al. or Ueda et al. as applied to claims 1, 3-4, 7-8, 10-11, 14, 16-17, and 20-22 above, and further in view of Satake et al. (U.S. 5,814,685)

The difference between Schwarz in view of Ohta et al. and either Wild et al. or Ueda et al. and the present claimed invention is the requirement in the claims of acid number of the dispersant.

Satake et al., which is drawn to inks, disclose the use of dispersant possessing acid number of 50-200 and disclose that if the acid number is lower, stability is lowered and if the acid number is higher, water resistance of printed matter decreases (col.4, line 62-col.5, line 1).

In light of the motivation for using dispersant with specific acid number disclosed by Satake et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use dispersant with such acid number in Schwarz in order to produce ink or pigment dispersion with good stability wherein the ink possesses good water resistance, and thereby arrive at the claimed invention.



**Response to Arguments**

8. Applicants' arguments and 1.132 declaration regarding Nadolsky (U.S. 6,841,592) have been considered but they are moot in view of the discontinuation of the use of this reference against the present claims.

9. Applicants' arguments and 1.132 declaration filed 6/14/06 have been fully considered but, with the exception of arguments relating to Nadolsky, they are not persuasive.

Specifically, applicants argue that the rejections of record, i.e. utilizing Schwarz in combination with Wild et al. or Ueda et al., are no longer relevant against the present claims in light of applicants' 1.132 declaration filed 6/14/06.

The declaration compares ink within the scope of the present claims, i.e. comprising dispersion formed by dispersing monoalkyl maleate graft polymer of maleic anhydride/ $\alpha$ -olefin copolymer in water in the presence of base, pigment, and an aqueous medium wherein the aqueous medium comprises water and diethylene glycol monobutyl ether (example A), with ink outside the scope of the present claims, i.e. comprising dispersion formed by dispersing monoalkyl maleate graft polymer of maleic anhydride/ $\alpha$ -olefin copolymer in water in the presence of base, pigment, and an aqueous medium wherein the aqueous medium comprises water and dipropylene glycol (ink B) or propylene glycol (ink C). It is shown that the ink of the present invention is superior in terms of discharge characteristics, water-resistance, and fixation.

However, it is the examiner's position that the declaration is not persuasive given that the declaration is not commensurate in scope with the scope of the "closest" prior art, namely, Schwarz in combination with Wild et al. or Ueda et al.

Specifically, as the monoalkyl maleate graft polymer of maleic anhydride/ $\alpha$ -olefin copolymer, the declaration utilizes copolymer prepared from example 1 of Nadolsky (which is no longer utilized in the rejections of record). Further, as noted by applicants on page 9 of the amendment filed 6/14/06, the polymer of Schwartz taken in combination with Wild et al. or Ueda et al. also comprises polyethylene oxide portion. Thus, the declaration is not commensurate in scope with the scope of Schwartz taken in combination with Wild et al. or Ueda et al. given that the polymer utilized in the examples of the declaration is outside the scope of the cited prior art.

Applicants also argue that there is no motivation to combine Schwarz with Wild et al. or Ueda et al. given that neither Wild et al. or Ueda et al. disclose ink jet ink.

While it is agreed that there is no disclosure in Wild et al. or Ueda et al. of ink jet ink, it is noted that according to MPEP 2141.01 (a), a reference may be relied on as a basis for rejection of an applicants' invention if it is "reasonably pertinent to the particular problem with which the inventor is concerned." A reasonably pertinent reference is further described as one which "even though it maybe in a different field of endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." Wild et al. and Ueda et al. are, therefore, reasonably pertinent references, because they teach that grafting maleate to ethylene polymer (Wild et al.) or polyolefin grafted with maleic anhydride (Ueda et al.) produces polymer with excellent adhesion (Wild et al.) or produces composition with excellent fixability to paper and excellent bending resistance (Ueda et al.) which are functions especially pertinent to the invention at hand where it is important that ink have good adhesion to paper or where it is important that inks have good fixability to paper

so that the ink does not smudge or smear and have good bending resistance so that the ink does not crack when the substrate on which it is utilized is bent, folded, etc.

**Allowable Subject Matter**

10. Claims 23-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 23-25 would be allowable if rewritten in independent form as described above for the following reasons.

Schwarz (U.S. 6,433,039) disclose ink jet ink comprising aqueous pigment dispersion formed by dispersing a maleic anhydride/ $\alpha$ -olefin copolymer in water in the presence of aqueous medium, base, and pigment, however, there is no disclosure in Schwarz of monoalkyl maleate graft polymer of maleic anhydride/ $\alpha$ -olefin copolymer as presently claimed. In order to meet the requirements of the present claims regarding the specific graft polymer, Schwarz is combined with Wild et al. (U.S. 5,310,806) or Ueda et al. (U.S. 4,810,612) which each teach grafting polymer with maleate.

However, the maleic anhydride/ $\alpha$ -olefin copolymer of Schwarz requires that the copolymer possesses, in addition to the maleic anhydride portion and  $\alpha$ -olefin portion, a polyethylene oxide portion which falls outside the scope of present claims 23-25 that each require monoalkyl maleate graft polymer of maleic anhydride/ $\alpha$ -olefin copolymer that “consists of” a maleic anhydride portion, an  $\alpha$ -olefin portion, and a monoalkyl maleate portion.

**Conclusion**

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

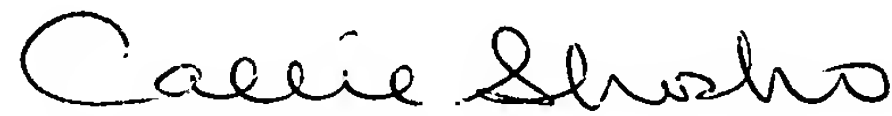
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1714

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8/25/06